(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 13 May 2004 (13.05.2004)

PCT

(10) International Publication Number WO 2004/040914 A1

(51) International Patent Classification⁷:

H04N 7/30

(21) International Application Number:

PCT/IB2002/004577

(22) International Filing Date:

1 November 2002 (01.11.2002)

(25) Filing Language:

English

(26) Publication Language:

English

- (71) Applicant (for all designated States except US): NOKIA CORPORATION [FI/FI]; Keilalahdentie 4, FIN-02150 Espoo (FI).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): LAPPALAINEN, Ville [FI/FI]; Neilikkakuja 3 D 10, FIN-33710 Tampere (FI). SÄRKIJÄRVI, Juha [FI/FI]; Teekkarinkatu 15 C 42, FIN-33720 Tampere (FI).
- (74) Agent: AWAPATENT AB; Box 45086, S-104 30 Stockholm (SE).
- (81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE

(utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

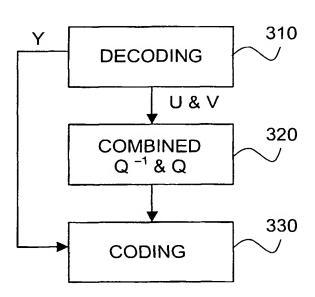
Declarations under Rule 4.17:

as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, F1, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, S1, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent

[Continued on next page]

(54) Title: A METHOD AND DEVICE FOR TRANSCODING IMAGES

300



(57) Abstract: A method and a device for transcoding digital images is disclosed. At least portions of a first image coded according to a first method is decoded for obtaining first coefficients of a luminance component and chrominance components of the first image. Furthermore, the first coefficients of the chrominance components of the first image are subjected to a combined inverse quantization according to the first method and quantization according to a second method. The combined inverse quantization and quantization uses a chrominance quantization matrix of the first method for inverse quantization according to the first method and a luminance quantization matrix of the first method for quantization according to the second method, for obtaining second coefficients for chrominance components of at least portions of a second image according to a second method having the same chroma format as the JPEG image. Finally, the first coefficients of the luminance component

of the at least portions of the first image and the second coefficients of the chrominance components of the at least portions of the second image are coded for obtaining at least portions of the second image decodable according to the second method.

WO 2004/040914 A1



(AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

— of inventorship (Rule 4.17(iv)) for US only

Published:

with international search report



PCT/IB 02/04577

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H04N7/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

INSPEC, EPO-Internal, WPI Data, PAJ, IBM-TDB, COMPENDEX

Category °	Citation of document, with Indication, where appropriate, of	Relevant to claim No	
A	FUKUHARA T ET AL: "Motion-JP standardization and target ma PROCEEDINGS 2000 INTERNATIONA ON IMAGE PROCESSING (CAT. NO. PROCEEDINGS OF 7TH IEEE INTER CONFERENCE ON IMAGE PROCESSIN BC, CANADA, 10-13 SEPT. 2000, pages 57-60 vol.2, XP002243 2000, Piscataway, NJ, USA, IE ISBN: 0-7803-6297-7 the whole document	rrket" AL CONFERENCE OOCH37101), RNATIONAL IG, VANCOUVER,	1-24
A	W0 02 03705 A (POWERTV INC) 10 January 2002 (2002-01-10) page 6, line 5 -page 7, line page 14, line 22 -page 15, li abstract; figures 1,10	3 ne 18 -/	1-24
X Furth	er documents are listed in the continuation of box C.	X Patent family members are	isted in annex.
"A" documer consider filing da filin	nt which may throw doubts on priority claim(s) or s cited to establish the publication date of another or other special reason (as specified) nt referring to an oral disclosure, use, exhibition or	"T" later document published after the or priority date and not in conflic cited to understand the principle invention "X" document of particular relevance; cannot be considered novel or cinvolve an inventive step when the considered to involve document of particular relevance; cannot be considered to involve document is combined with one ments, such combination being in the art. "&" document member of the same p	t with the application but or theory underlying the the claimed invention annot be considered to the document is taken alone the claimed invention an inventive step when the or more other such docupobylous to a person skilled
Date of the a	ctual completion of the international search	Date of mailing of the internation	
11	June 2003	2 4 07. 20	003
Name and m	ailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer ALEXANDER LAKI	C/JA A



Form PCT/ISA/210 (continuation of second sheet) (July 1992)

PCT	/ĪB	02/	04	577

C.(Continu	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JA-LING WU ET AL: "An efficient JPEG to MPEG-1 transcoding algorithm" 1996 INTERNATIONAL CONFERENCE ON CONSUMER ELECTRONICS, ROSEMONT, IL, USA, 5-7 JUNE 1996, vol. 42, no. 3, pages 447-457, XP002243915 IEEE Transactions on Consumer Electronics, Aug. 1996, IEEE, USA ISSN: 0098-3063 the whole document	1-24
Α	ACHARYA S ET AL: "Compressed domain transcoding of MPEG" PROCEEDINGS. IEEE INTERNATIONAL CONFERENCE ON MULTIMEDIA COMPUTING AND SYSTEMS (CAT. NO.98TB100241), PROCEEDINGS IEEE INTERNATIONAL CONFERENCE ON MULTIMEDIA COMPUTING AND SYSTEMS, AUSTIN, TX, USA, 28 JUNE-1 JULY 1998, pages 295-304, XP002243916 1998, Los Alamitos, CA, USA, IEEE Comput. Soc, USA ISBN: 0-8186-8557-3 the whole document	1-24



INTERNATIONAL SEARCH REPORT

PCT/IB 02/04577

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 0203705	Α	10-01-2002	EP WO	1295480 A2 0203705 A2	26-03-2003 10-01-2002